Massachusetts Department of Fire Services
Smoke alarm performance and smoke characterization study

Board of Fire Prevention Regulations, Chairman David Demers
Board of Building Regulations and Standards, Chairman Gary Moccia

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The recently released Position Paper on Smoke Alarms – Ionization and Photoelectric Technology ("IAFC Position Paper") from the Fire and Life Safety Section of the IAFC has created on opportunity for building and fire code regulators to revisit the use and effectiveness of smoke alarm regulations for residential buildings.

Over the past several years, various studies have been conducted on the effectiveness of residential smoke alarms to quickly and effectively alert occupants to the types of fires occurring in today's homes. Studies have also been conducted to assess the effectiveness of smoke alarms to alert occupants, particularly children, the elderly, hearing impaired and adults with alcohol or drug impairment.

The IAFC Position Paper is prefaced with the statement that "smoke alarms are only one component of a comprehensive residential fire protection plan that also includes the installation of fire sprinklers and fire escape planning." There are many components to a comprehensive residential fire protection plan; from initial construction through property maintenance requirements and through public fire safety education programs.

One of the recommendations from the IAFC Position Paper is to begin educating the public on the benefits of both ionization and photoelectric smoke alarm technology and the potentially faster response time of dual-technology smoke alarms.

That recommendation is an important consideration for the group present here today and there are several related issues to consider in the context of how Massachusetts will conduct public education and, perhaps, amend smoke alarm regulations. The issue can further be divided on how to treat existing homes and how to improve new construction.

As the state of Massachusetts studies this issue, there are some important questions that should be reviewed regarding the effectiveness of the existing residential fire protection in the state:

1. What percentage of homes contain at least one working smoke alarm?
2. What is the percentage of homes with smoke alarms installed in all locations as required by the International Residential Code (each sleeping room, hallways outside sleeping rooms and at least one on each floor)?
3. What is the percentage of homes with hard-wired, interconnected smoke alarms that include battery back-up, as required by the International Residential Code?
4. What is the percentage of homes with smoke alarms that are less than 10 years old (the useful life recommended by the smoke alarm industry)?

This information can be used to evaluate the current level of protection provided by smoke alarms in your community. While it is important to consider new technologies and scientific data, our ability to affect change in people's understanding of the fire problem in America and also change their behaviors in both preventing fires and properly responding in fire situations has been seriously lacking.

The recommendation to install both ionization and photoelectric smoke alarms in all locations or utilize dual technology may be easier to accomplish in new construction. Achieving this recommendation in existing homes may meet with public resistance due to cost. In addition, if the citizens of Massachusetts are not proactively changing smoke alarm batteries, what is the likelihood they will purchase and install new smoke alarms?

For those communities considering a revision to their new construction regulations that would encompass recent developments in smoke alarm technology and our knowledge of smoke alarm performance, it would be beneficial to participate with UL and the ICC in their respective standard and code development process. There is sure to be a diligent review by the UL 217 Standard Committee and the International Residential Code Review Committee based on the information in the UL Study and the NIST Report on smoke alarm effectiveness and technology.

UL 217 sets performance standards for electrically operated single and multiple station smoke alarms. UL will certainly be looking at available alternatives for reducing the time needed for a smoke alarm to activate and for improving occupant alerting methods (audible and visual) based on recent studies analyzing occupant response.

The International Residential Code utilizes a governmental consensus process to ensure the highest level of life safety in its codes and encourages consideration of the latest technology and scientific data when establishing new code requirements. The ICC would welcome your participation and input for establishing the appropriate Code requirements for smoke alarm installation and maintenance.

For those communities considering possible retroactive requirements and/or new public education programs; device cost is sure to be raised as an issue. The best opportunity to get new smoke alarms into existing homes and to also deliver effective “one on one” public education is a funded “smoke alarm replacement program”. Many fire departments, public safety agencies and private foundations have funded successful programs that have installed thousands of smoke alarms in these community based programs. A “smoke alarm replacement and education program” could provide the opportunity to implement some of the initiatives in the IAFC Position Paper. Such a program may also provide an opportunity for replacement smoke alarms older than 10 years and even introduce wireless interconnection technology in older homes.

With the availability of new smoke alarm technology and the new information from studies on how people react (or fail to react) when a smoke alarm sounds its alert, there are now many choices on how to best proceed. For those charged with protecting the public in the built environment, this review of smoke alarm performance and effectiveness is the most comprehensive review undertaken since smoke alarms were first introduced over thirty years ago. Your decisions should be guided by a process of practicality and consensus building that will provide the best long-term public fire protection and safety for the citizens of your community. Your participation with the development of the International Residential Code will allow you to do exactly that. The ICC invites you to submit proposals and provide public comment to the International Residential Code, so that all communities utilizing this construction code will have the highest level of safety.

I thank you for you time and would be happy to answer any questions.

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